



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

IN RE APPLICATION OF: Michael PERSSON et al.

APPLICATION NO.: 09/455,102

FILING DATE: December 6, 1999

TITLE: POLYSILICATE MICROGELS

GROUP ART UNIT: 1712

EXAMINER: R. Lovering

Assistant Commissioner for  
Patents  
Washington, D.C. 20231

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**REQUEST FOR AN INTERFERENCE**

Dear Sir:

For the reasons expressed herein in detail, the Applicant respectfully requests the declaration of an interference between claims in the instant application and claims in U.S. Patent Nos. 6,083,997 and 6,200,420, both to Begala *et al.*, copies of which are submitted herewith.

**REMARKS**

As set forth below, an interference exists and should be declared between claims 87 and 78 of the instant application and claims 1 and 14 of U.S. Patent No. 6,083,997 to Begala *et al.* ("the Begala '997 patent") and claim 1 of U.S. Patent No. 6,200,420 to Begala *et al.* ("the Begala

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'420 patent). Each of the requirements of 37 C.F.R. § 1.607 is addressed below, *seriatim*. The effective filing date of the instant application is June 9, 1997, which is prior to the earliest effective filing date of July 28, 1998 for both the Begala '997 patent and the Begala '420 patent.

**I. Compliance With 37 C.F.R. § 1.607**

**(1) Identity of the Interfering Patent**

As set forth above, the Applicant hereby respectfully requests that an interference be declared between claims 87 and 78 of the instant application and claims 1 and 14 in U.S. Patent No. 6,087,997 to Begala *et al.* ("the Begala '997 patent"), which issued on July 4, 2000, and claim 1 in U.S. Patent No. 6,200,420 to Begala *et al.* ("the Begala '420 patent"), which issued on March 13, 2001.

**(2) Presentation of the Proposed Count**

The Applicant respectfully proposes that the following count be established in the interference between the instant application, the Begala '997 patent and the Begala '420 patent.

**Count 1**

A process for preparing an aqueous anionic polysilicate microgel which comprises mixing:

- (i) an aqueous solution of sodium silicate; with
- (ii) an aqueous phase of silica-based material having a pH of 11 or less; and

- (iii) an organic acid; or

An aqueous anionic polysilicate microgel prepared by the process which comprises the steps of mixing:

- (i) an aqueous solution of sodium silicate; with
- (ii) an aqueous phase of silica-based material having a pH of 11 or less; and
- (iii) an organic acid; or

A method of producing an anionic nanocomposite for use as a retention and drainage aid in papermaking comprising the steps of:

- (i) providing a sodium silicate solution
- (ii) adding an anionic polyelectrolyte to the sodium silicate solution; and
- (iii) combining the sodium silicate solution containing the anionic polyelectrolyte with silicic acid; or

An anionic nanocomposite for use as a retention and drainage aid in papermaking prepared by the process comprising the steps of:

- (i) providing a sodium silicate solution
- (ii) adding an anionic polyelectrolyte to the sodium silicate solution; and
- (iii) combining the sodium silicate solution containing the anionic polyelectrolyte with silicic acid.

In a first alternative formulation, the Count recites the language used in claim 87 of the instant application. In a second alternative formulation, the Count recites the language used in claim 78 of the instant application. In a third alternative formulation, the Count recites the language of claim 1 of the Begala '997 patent. In a fourth alternative formulation, the Count recites the language of claim 14 of the Begala '997 patent.

Claim 87 of the instant application depends from independent claim 82, while Claim 78 of the instant application depends from independent claim 47. For purposes of the discussion that follows, claim 87 has been re-written in independent form, to incorporate the limitations of claim 82 and claim 78 has been re-written in independent form, to incorporate the limitations of claim 47.

The charts presented on the following pages compare the language of claim 87 of the instant application and claim 1 of the Begala '997 patent, and the language of claim 78 of the instant application and claim 14 of the Begala '997 patent. The charts are followed by a discussion which demonstrates that (1) claim 87 of the instant application corresponds to the Count and is directed to the same patentable invention as claim 1 of the Begala '997 patent and (2) claim 78 of the instant application corresponds to the Count and is directed to the same patentable invention as claim 14 of the Begala '997 patent.

# **FORMULATION OF COUNT 1**

<b>Claim 87 of the Persson Application</b>	<b>Claim 1 of the Begala '997 Patent</b>	<b>Comparison of Claim 87 and Claim 1</b>
<p>A process for preparing an aqueous anionic polysilicate microgel which comprises mixing:</p>	<p>A method of producing an anionic nanocomposite for use as a retention and drainage aid in papermaking comprising the steps of:</p>	<p>The polysilicate microgel of the Persson application is identical to the nanocomposite of claim 1 of the Begala '997 patent. Both describe methods for preparing aqueous dispersions of microparticulate silica-based material, further incorporating anionic species. Both the Persson application and the Begala '997 patent relate to processes for preparation of materials which can be used in papermaking. The process presented in Count 1 is the same as that recited in claim 87 of the instant Persson application.</p>
<p>(i) an aqueous solution of sodium silicate; with</p>	<p>a) providing a sodium silicate solution;</p>	<p>Both Claim 87, as dependent from claim 82, and claim 1 of the Begala '997 patent recite a sodium silicate solution. Claim 87 of Persson recites that the solution is aqueous.</p>

Claim 87 of the Persson Application	Claim 1 of the Begala '997 Patent	Comparison of Claim 87 and Claim 1
(ii) an aqueous phase of silica-based material having a pH of 11 or less; and	c) combining the sodium silicate solution containing the anionic polyelectrolyte with silicic acid.	Element (ii) of claim 87, as dependent from claim 82, corresponds to element (c) of claim 1 of the Begala '997 patent. Included in materials enumerated in the Persson application are polysilicic acid and polymeric silicic acid. Each element encompasses the use of a silicic acid.
(iii) an organic acid.	b) adding an anionic polyelectrolyte to the sodium silicate solution; and	Element (iii) of claim 87, as dependent from claim 82, relates to element (b) of claim 1 of the Begala '997 patent. One of the materials enumerated in the Persson application is polyacrylic acid, while one group of materials enumerated in the Begala '997 patent are polyacrylates. Each element encompasses the use of anionic species including polyacrylates.

Claim 78 of the Persson Application	Claim 14 of the Begala '997 Patent	Comparison of Claim 78 and Claim 14
Aqueous anionic polysilicate microgel obtained by mixing:	An anionic nanocomposite for use as a retention and drainage aid in papermaking prepared by the process comprising the steps of:	The polysilicate microgel of the Persson application is identical to the nanocomposite of claim 14 of the Begala '997 patent. Both describe aqueous dispersions of microparticulate silica-based material, further incorporating anionic species. Both the Persson application and the Begala '997 patent relate to materials which can be used in papermaking. The composition presented in Count 1 is the same as that recited in claim 78 of the instant Persson application.
(i) an aqueous solution of alkali metal silicate; with	a) providing a sodium silicate solution;	Both Claim 78, as dependent from claim 47, and claim 1 of the Begala '997 patent recite an alkali metal silicate solution (claim 14 of the Begala '997 patent specifically recites sodium). Claim 47 of Persson recites that the solution is aqueous.

Claim 78 of the Persson Application	Claim 14 of the Begala '997 Patent	Comparison of Claim 78 and Claim 14
(ii) an aqueous phase of silica-based material having a pH of 11 or less; and	c) combining the sodium silicate solution containing the anionic polyelectrolyte with silicic acid.	Element (ii) of claim 78 as dependent from claim 47, corresponds to element (c) of claim 14 of the Begala '997 patent. Included in materials enumerated in the Persson application are polysilicic acid and polymeric silicic acid. Each element encompasses the use of a silicic acid.
(iii) an organic acid.	b) adding an anionic polyelectrolyte to the sodium silicate solution	Element (iii) of claim 78, as dependent from claim 47, relates to element (b) of claim 14 of the Begala '997 patent. One of the materials enumerated in the Persson application is polyacrylic acid, while one group of materials enumerated in the Begala '997 patent are polyacrylates. Each element encompasses the use of anionic species including polyacrylates.

**(3) Claims 1 and 14 of the Begala '997 Patent and Claim 1 of the Begala '420 Patent Correspond to the Count**

Claim 1 of the Begala '997 patent corresponds exactly to the third alternative of the Count.

Claim 1 of the Begala '997 patent corresponds substantially to the Count because claim 1 is obvious over the first alternative of the Count and the first alternative of the Count is obvious



over claim 1. Thus, claim 1 and the Count describe the same patentable invention. The differences in language between claim 1 and the first alternative of the Count are of no patentable significance. "Anionic nanocomposite," as recited in the preamble of claim 1, is simply another name for the "anionic polysilicate microgel" recited in the first alternative of the Count and in claim 87 of the instant application. As discussed below, essentially the same method steps are used by the Begala '997 patent and the instant application. Accordingly, the same products are obtained. The Begala '997 patent states "[a]s used herein, nanocomposite means the incorporation of an anionic polyelectrolyte into the synthesis of a colloidal silica." (Col. 3, lines 36-38). The method recited in claim 1 of the Begala '997 patent comprises the addition of an anionic polyelectrolyte to a sodium silicate solution followed by combination of the resultant mixture with silicic acid. Likewise, the first alternative of the Count discloses the preparation of an anionic polysilicate microgel by addition of an organic polyacid to an aqueous solution of sodium silicate, followed by addition of acidified alkali metal silicate. Furthermore, the recitation in the preamble of claim 1 of a use for the product produced by the method of the Count ("a retention and drainage aid in papermaking") does not impart a patentable distinction over the Count to a method that is obvious over the method of the Count.

Step (i) of the first alternative of the Count and step (a) of claim 1 of the Begala '997 patent recite the same sodium silicate solution. Thus, this step imparts no patentable distinction.

Step (b) of claim 1 of the Begala '997 patent recites "anionic polyelectrolyte" while the first alternative of the Count recites "organic acids." However, the Begala '997 patent teaches that organic acids are suitable "anionic polyelectrolytes." "The anionic polyelectrolytes which may be used in the practice of this invention include polysulfonates, polyacrylates and

polyphosphonates.” (Col. 3, lines 65-67). Polyacrylates, as is well known, are organic acids. The present application also teaches the use of polyacrylates. “Suitable acids include organic acids,” and “organic polyacids, such as polymers containing carboxylic acid and sulphonic acid groups, such as polyacrylic acids.” (Page 6, lines 11-14). Thus, the limitation of claim 1 of the Begala ‘997 patent regarding an anionic polyelectrolyte corresponds to the organic acid recited in the claims of the instant application and in the Count. Given the disclosure of the Begala ‘997 patent as to anionic polyelectrolytes and polyacrylates, combined with the role played by the polyacrylates in the invention, it would have been obvious to one of ordinary skill in the art to substitute polyacrylic acid, and by extension, other organic acids, for anionic polyelectrolytes in the method at issue, thus arriving at the limitation of the first alternative of the Count. Moreover, for the same reasons, it would also have been obvious to substitute the anionic polyelectrolytes of claim 1 of the Begala ‘997 patent for the organic acids of the instant application and the first alternative of the Count.

Step (c) of claim 1 of the Begala ‘997 patent recites the addition of silicic acid. The first alternative of the Count recites “silica-based material having a pH of 11 or less.” The present application discloses “the silica-based material used for mixing with the alkali metal silicate solution is an acidified alkali metal silicate. Suitable acidified alkali metal silicates include polysilicic acid, polymeric silicic acid, active, or activated, silica, and polysilicates.” (Page 4, lines 17-19). Thus, both claim 1 of the Begala ‘997 patent and the instant application teach the use of silicic acid in this step. It would have been an obvious design choice to use “silica-based material” given the disclosure of “silicic acid” in claim 1. It would also have been an obvious design choice to use “silicic acid” based on the disclosure of “silica-based material” in the first

alternative of the Count. Moreover, it would have been a routine design choice for one of ordinary skill in the art to choose a pH of 11 or less, as recited in the first alternative of the Count, given the nature of the invention. This can be seen from the teaching of the Begala '997 patent at Col. 4, lines 24-40. In this passage, the Begala '997 patent describes an embodiment in which the polyelectrolyte, sodium silicate solution, and silicic acid are combined in the presence of a resin, with the silicic acid being generated in situ on the resin. The Begala '997 patent teaches that this process should occur at a pH of "about 10.8 to 11.3" which "decreases with time." This pH range falls within the limitation as to pH recited in the first alternative of the Count. Accordingly, no patentable distinction between claim 1 of the Begala '997 patent and the first alternative of the Count can be attributed to the different language used for this step.

Claim 1 of the Begala '997 patent recites adding an anionic polyelectrolyte to the sodium silicate solution, and combining the sodium silicate solution containing anionic polyelectrolyte with silicic acid. The first alternative of the count recites combining an aqueous solution of sodium silicate with an aqueous phase of silica-based material having a pH of 11 or less and an organic acid. The present application discloses that any order of mixing can be used. (Page 6, line 16). Thus, both claim 1 of the Begala '997 patent and the instant application teach an identical order of addition. Accordingly, no patentable distinction between claim 1 of the Begala '997 patent and the first alternative of the Count can be attributed to the specific order of addition recited in claim 1 of the Begala '997 patent.

Similarly, claim 14 of the Begala '997 patent is directed to the same patentable invention as the Count. Claim 14 corresponds exactly to the fourth alternative of the Count. Since claim 14 merely claims the product produced by the method of claim 1, with respect to claim 1 and the

first alternative of the Count, claim 14 is obvious over the second alternative of the Count and the second alternative of the Count is obvious over claim 14 for the same reasons as discussed above.

Claim 1 of the Begala '420 patent corresponds substantially to the Count because claim 1 is obvious over the first alternative of the Count and the first alternative of the Count is obvious over claim 1. Thus, claim 1 and the Count describe the same patentable invention. The differences in language between claim 1 and the first alternative of the Count are of no patentable significance. Claim 1 of the Begala '420 patent recites:

A method of increasing retention and drainage in papermaking comprising the steps of:

- a) forming an aqueous cellulosic papermaking slurry;
- b) adding to the slurry a polymer selected from the group consisting of cationic, anionic, nonionic and amphoteric flocculants;
- c) adding to the slurry an anionic nanocomposite, the anionic nanocomposite being prepared by (i) providing a sodium silicate solution; (ii) adding an anionic polyelectrolyte to the sodium silicate solution; and (iii) combining the sodium silicate solution containing the anionic polyelectrolyte with silicic acid; and
- d) draining the slurry to form a sheet; and
- e) drying the sheet.

The recitation in the preamble of claim 1 of a use for the product produced by the method of the Count ("a retention and drainage aid in papermaking") does not impart a patentable distinction over the Count to a method that is obvious over the method of the Count.

Claim 1 of the Begala '420 patent recites "forming an aqueous cellulosic papermaking slurry" followed by "adding to the slurry a polymer selected from the group consisting of cationic, anionic, nonionic and amphoteric flocculants." The present application teaches the use of polysilicate microgels as flocculating agents in combination with organic polymers selected from anionic, amphoteric, nonionic and cationic polymers. (Page 7, lines 30-32). Thus, both claim 1 of the Begala '420 patent and the instant application teach the use of polymeric flocculating agents. It would have been obvious to one of ordinary skill in the art to select a polymeric flocculating agent from cationic, anionic, nonionic and amphoteric flocculants. Moreover, it would have been obvious to use such a polymeric flocculating agent in combination with an anionic silicate microgel recited in the Count. Accordingly, no patentable distinction between claim 1 of the Begala '420 patent and the first alternative of the Count can be attributed to the additional limitations of claim 1.

Step (c) of claim 1 of the Begala '420 patent is directed to the same patentable invention as the Count. Step (c) of claim 1 corresponds substantially to the fourth alternative of the Count. Since step (c) of claim 1 of the Begala '420 patent merely recites the addition to the slurry of the product produced by the method of claim 1 of the Begala '997 patent, with respect to claim 1 of the Begala '997 patent and the first alternative of the Count, step (c) of claim 1 is obvious over the second alternative of the Count and the second alternative of the Count is obvious over claim 1 step (c) for the same reasons as discussed above.

Steps (d) and (e) of claim 1 of the Begala '420 patent are directed to draining the slurry to form a sheet and drying the sheet. The instant application discloses that "[t]he papermaking process according to the invention can be used for producing cellulosic products in sheet or web

form such as for example pulp sheets and paper. (Page 10, lines 11-12). Thus, both claim 1 of the Begala '420 patent and the instant application teach the addition of an organic polymer and a polysilicate microgel to an aqueous cellulosic papermaking slurry in order to improve retention and drainage, followed by draining the slurry and drying the resulting sheet. Accordingly, no patentable distinction between claim 1 of the Begala '420 patent and the first alternative of the Count can be attributed to the additional limitations recited in claim 1.

**(4) Claims 87 and 78 of this Persson Application Correspond to the Count**

Claim 87 of the instant Persson application is fully embraced within Count 1 and, like claim 1 of the Begala '997 patent, is the same patentable invention as, and corresponds to the Count. The process recited in claim 87 is identical to that recited in the first alternative of the Count. Thus, claim 87 corresponds exactly to the first alternative of the Count. Since claim 87 is identical to the first alternative of the Count and, as discussed above, the first alternative of the Count is directed to the same patentable invention as is claim 1 of the Begala '997 patent, then claim 87 is directed to the same patentable invention as claim 1 of the Begala '997 patent. Accordingly, claim 87 corresponds substantially to the third alternative of the Count, which is identical to claim 1 of the Begala '997 patent.

Claim 78 of the instant Persson application is identical to the second alternative of the Count. Thus, claim 78 corresponds exactly to the second alternative of the Count. Since claim 78 is identical to the second alternative of the Count and, as discussed above, the second alternative of the Count is directed to the same patentable invention as is claim 14 of the Begala

'997 patent, then claim 78 is directed to the same patentable invention as claim 14 of the Begala '997 patent. Accordingly, claim 78 corresponds substantially to the fourth alternative of the Count, which is identical to claim 14 of the Begala '997 patent.

**(5) Applying the Terms of any Claims Added to this Application and Identified as Corresponding to the Count**

No new claims are added to the Application.

**(6) Compliance with 35 U.S.C. § 135(b)**

The Begala '997 patent issued on July 4, 2000, while the Begala '420 patent issued on March 13, 2001. Claims 47 and 78 of the instant application were introduced by a preliminary amendment filed on June 9, 2000, while claims 82 and 87 of the instant application were introduced by a supplemental amendment filed on April 25, 2001. Thus, the claims in the present request were introduced less than one year after the issuance of both the Begala '997 patent and the Begala '420 patent. Accordingly, the Applicant's instant request for an interference with the Begala '997 patent and the Begala '420 patent satisfies all of the provisions of 35 U.S.C. § 135(b).

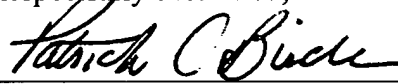
**III. Conclusion**

For all of the foregoing reasons, the Applicant respectfully submits that there is a basis for an interference and therefore an interference should be declared between claims 87 and 78 of the instant application and claims 1 and 14 of the Begala '997 patent, and claim 1 of the Begala '420

patent, in the manner and under the proposed Count set forth above. The Applicant further requests that the Examiner contact the undersigned in the event that a discussion of this submission is deemed helpful to resolving this request. The Commissioner is authorized to charge any required fees that may be due to Deposit Account No.11-0600.

December 13, 2002

Respectfully submitted,



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